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Class 12 Maths

Complete Formula Sheet

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Matrices, Determinants & Relations

- $|AB| = |A| \times |B|$; a matrix is invertible if $|A| \neq 0$.
- Inverse: $A^{-1} = \text{adj}(A) / |A|$.
- A relation is reflexive, symmetric or transitive; an equivalence relation is all three.
- A function is one-one (injective), onto (surjective) or both (bijective).

Calculus

- $d/dx (x^n) = n x^{n-1}$; chain rule: $dy/dx = dy/du \times du/dx$.
- $\int x^n dx = x^{n+1}/(n+1) + C$ ($n \neq -1$).
- $\int (1/x) dx = \ln|x| + C$; $\int e^x dx = e^x + C$.
- Area under a curve = definite integral between limits.
- A differential equation has an order and a degree.

Vectors & 3D Geometry

- Dot product: $a \cdot b = |a||b| \cos\theta$.
- Cross product magnitude: $|a \times b| = |a||b| \sin\theta$.
- Direction cosines l, m, n satisfy $l^2 + m^2 + n^2 = 1$.
- Equation of a plane: $ax + by + cz = d$.

Probability & Linear Programming

- Conditional probability: $P(A|B) = P(A \cap B) / P(B)$.
- Bayes' theorem relates conditional probabilities.
- Independent events: $P(A \cap B) = P(A) \times P(B)$.
- LPP: optimise a linear objective subject to linear constraints.

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